MOODY'S INVESTORS SERVICE

SECTOR IN-DEPTH
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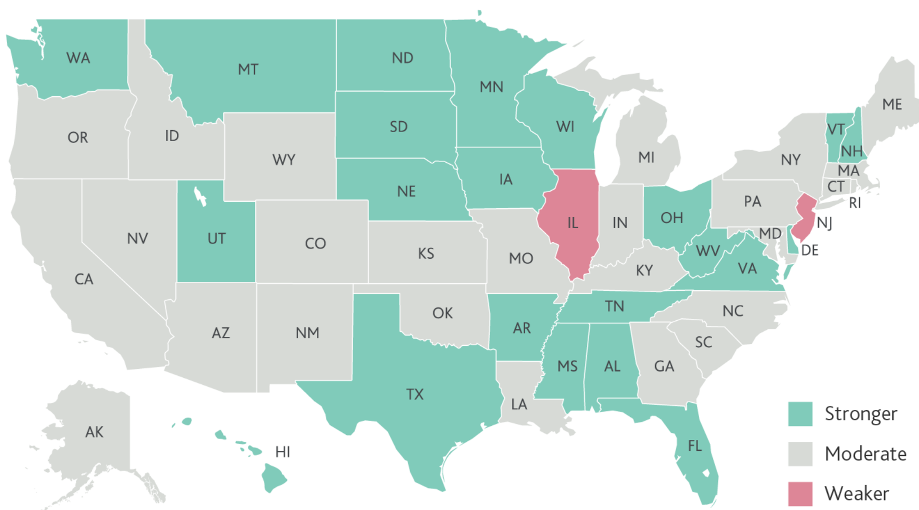
State government - US

Most states have the financial flexibility and reserves to manage a recession

Economic conditions in the US are strong, and the probability of a recession beginning within the next year appears to be low. States are aware that a downturn will come eventually, however, and are building reserves to prepare. According to our scenario analysis, most states will be able to weather a moderate recession without significant adverse credit impact, in large part because of healthy reserves and inherently strong fiscal flexibility. Recession preparedness is stronger for 22 states, moderate for 26 and weaker for two (see Exhibit 1).

Exhibit 1
22 states are stronger and two weaker in recession preparedness



Source: Moody's Investors Service

The factors used as inputs in our scenario analysis are detailed in the following pages.

Factor 1: Revenue volatility (25%)

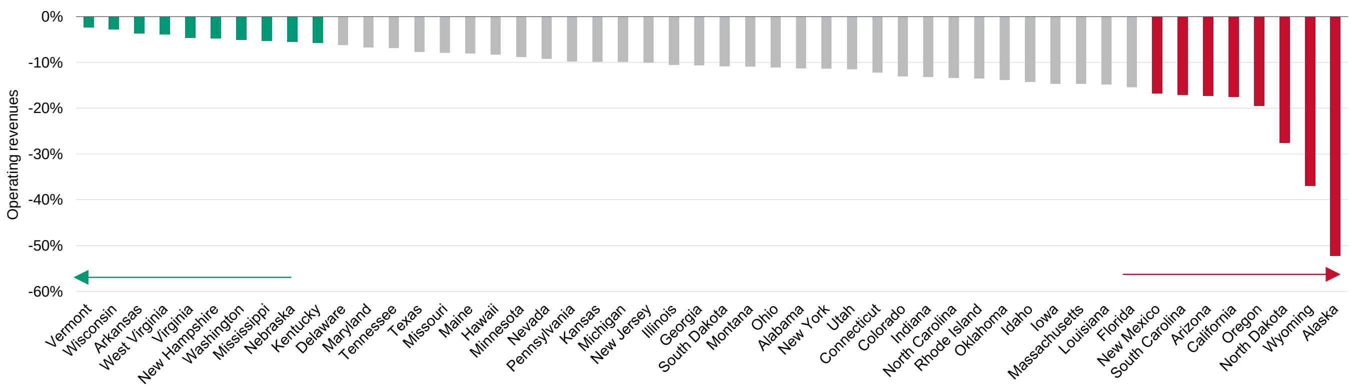
We based scoring for this measure on an analysis of prior revenue volatility. We looked at the greatest one-year revenue declines for each of the 50 states, from 2000 to 2018, and scored each state on whether they were more than approximately one standard deviation above or below the average.[1]

Stronger	Moderate	Weaker
Revenue volatility better than -6%	Revenue volatility between -6% and -16%	Revenue volatility worse than -16%

Exhibit 2

Operating revenues have been most volatile for energy states

Greatest one-year decline in operating revenues (2000-2018)



Source: Moody's Investors Service

Revenues may be more volatile in next downturn as many states' reliance on personal income taxes grows

Even if the next recession is moderate, state revenues could be nearly as volatile as they were in the 2008-09 recession because many states have become more reliant on personal income taxes and on their highest earners. States with historically the most volatile revenues are those that rely on the energy sector as well those relying on the highest earners through high and progressive personal income tax rates.

- From 2000-2018, Alaska (Aa3 stable), Wyoming (unrated) and North Dakota (Aa1 stable) had the most severe one-year revenue declines. Oregon (Aa1 stable), California (Aa3 positive) and Arizona (Aa2 stable) follow close behind. These states rely on the volatile energy sector and on volatile personal income taxes.
- Vermont (Aa1 stable), Wisconsin (Aa1 stable) and Arkansas (Aa1 stable) have been the most stable as they don't rely heavily on volatile revenue streams.

States have been adept at managing revenue volatility in past recessions, generally maintaining their high credit quality through economic cycles. Depending on what drives the next recession, different states will be affected, and may be tested, in different ways.

Most states saw their greatest revenue decline in 2009 after the housing and financial sector collapse, and recovery was very slow over multiple years. The 2001-2003 recession was caused by the tech bubble bursting, which hurt a few states such as California the most. The energy states mostly saw their most significant revenue declines in 2015-2016. They generally did not see revenue volatility during the last recession, but could experience declines in the next recession if energy prices drop.

Factor 2: Coverage by reserves (25%)

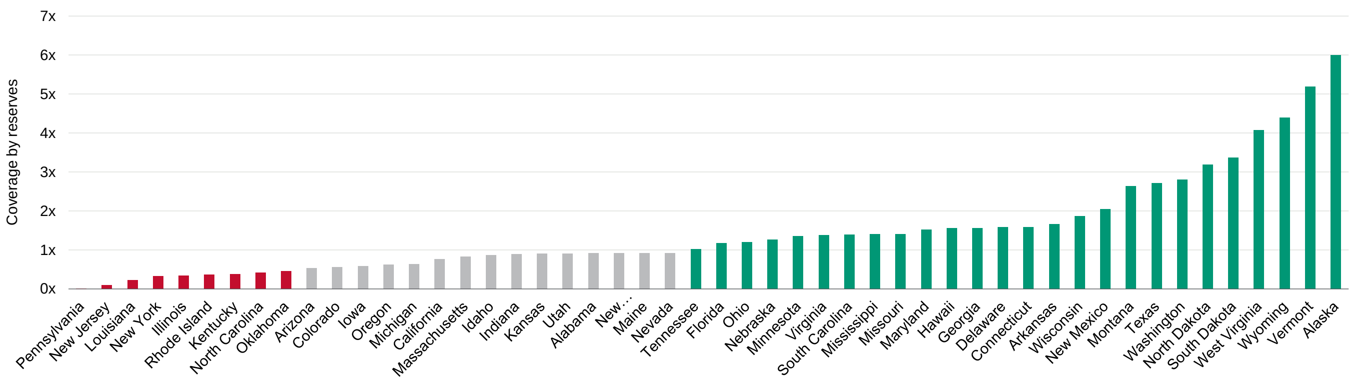
We scored this factor by taking the greatest one-year revenue decline in factor 1 and assessing the coverage of the revenue loss by our estimate of each state's rainy day fund and other available budgetary reserves.

Stronger	Moderate	Weaker
Coverage by reserves more than 1 times	Coverage between 0.5 times and 1 times	Coverage less than 0.5 times

Exhibit 3

26 states could cover a full year of revenue declines solely with reserves on hand

Coverage by reserves of revenue decline in recession scenario



Source: Moody's Investors Service

States with the highest revenue volatility have appropriately stockpiled reserves

One way states can deal with a revenue shortfall when a recession hits is to plug a portion of the budget gap with reserves. We applied our estimates of expected reserve levels to coverage of a revenue decline equal to the state's largest one-year revenue decline. In this scenario, 26 states would be able to cover the decline solely with reserves.

» Alaska, Wyoming and North Dakota, the three states with the greatest one-year revenue declines, also have the most expected coverage of a possible shortfall by their expected reserves. This is because they have stockpiled reserves in recent years.

» Pennsylvania (Aa3 stable), New Jersey (A3 stable), Louisiana (Aa3 stable), New York (Aa1 stable) and Illinois (Baa3 stable) have the lowest coverage by reserves of a shortfall in the recession scenario. If revenues declined to a degree equal to the worst one-year decline they had experienced in the past, they would not have enough reserves available to cover even half the shortfall. They would have to rely on other tools, such as midyear spending cuts, revenue increases, or one-time measures like borrowing.

» Reserves in some states come with restrictions on their use, and may not all be available for use in the first year of a revenue decline. For the purpose of this scenario analysis, however, we are counting the full amount of reserves as available.

Factor 3: Financial flexibility (30%)

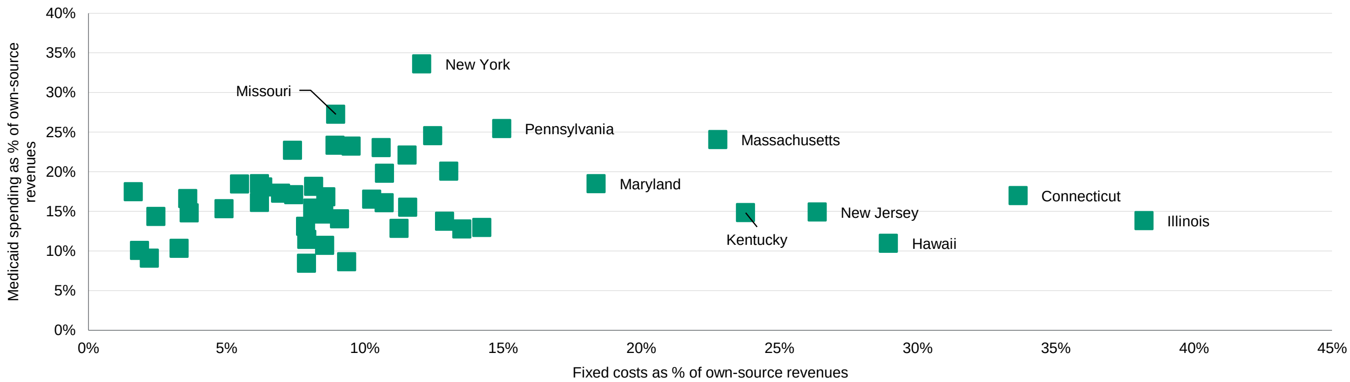
Our financial flexibility measure incorporates certain constitutional provisions that enable faster responses in a downturn, such as whether a state's executive branch has the authority to cut spending without legislative approval, and whether the state requires only a simple majority to pass tax increases and approve a budget. It also incorporates how much the state spends on fixed costs for debt service, pensions and retiree healthcare, and its spending on Medicaid. This factor also includes an assessment of each state's structural budget balance (i.e. whether recurring expenses are aligned with recurring revenues) as of 2019.

Stronger	Moderate	Weaker
0 restrictions on financial flexibility	1-4 restrictions on financial flexibility	5 restrictions on financial flexibility

This input is more heavily weighted than the others because budgetary flexibility is one of the key strengths of state governments and a reason they have maintained high credit quality through prior recessions.

Exhibit 4

High Medicaid spending and high fixed costs for debt service and retirement obligations can challenge financial flexibility



Source: Moody's Investors Service, Kaiser Family Foundation

Strong financial flexibility will be a key to managing next downturn

In the event of a recession, states have multiple tools to manage their fiscal position. In addition to accessing reserves, they generally have broad powers to adjust spending and raise revenue. They can also engage in intra-fund borrowing, long-term public borrowing, or payment shifts into the future. States scoring the highest on financial flexibility have the tools to manage budgetary shocks quickly, while states with more moderate flexibility may on occasion resort to one-time fixes and borrowing, or have delayed responses as solutions are sought.

» States that have strong structural balance, where recurring revenues are equal to or greater than recurring spending, are in a better position to respond to unanticipated revenue weakening.

» High fixed costs for debt service and retirement obligations limit flexibility and cause the need for greater savings or cuts in other programs. Pension cost is based on our "tread water" concept - combining annual service cost and interest on the unfunded liability at the start of the fiscal year.

» For the purposes of this recession scenario analysis, we consider Medicaid spending as a flexibility challenge, as it may be hard to adjust Medical spending downward quickly when revenues fall. In addition, more people are likely to lose employment and private health coverage in a recession, pushing Medicaid caseloads higher.

Factor 4: Pension risk (20%)

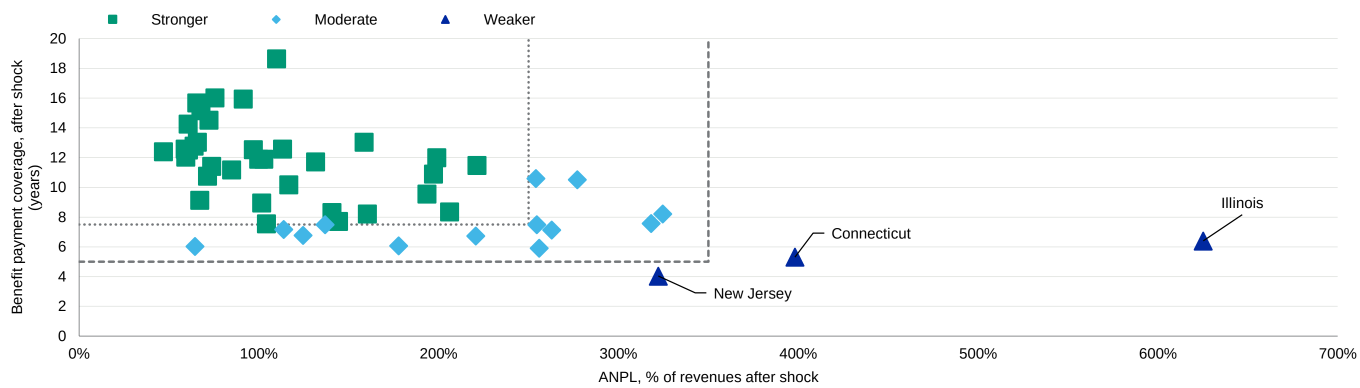
This factor is based on susceptibility to growth in unfunded pension liabilities and pension system cash flow strain in the event of negative investment market conditions. We assume pension assets are hit by a low-probability, but significant investment loss [2] and compare the resulting ratio of adjusted net pension liability (ANPL) to revenues, as well as the number of years of benefit payments that would be covered by the assets of states' largest pension systems after the loss.

Stronger	Moderate	Weaker
Applying a pension investment loss stress test with common probability and a revenue decline equal to a state's greatest decline since 2000, assets of state's largest pension system estimated to cover more than 7.5 years of benefit payments and ANPL estimated to remain below 250% of revenues.	After applying a pension investment loss stress test with common probability and a revenue decline equal to a state's greatest decline since 2000, assets of state's largest pension system estimated to cover between 5 and 7.5 years of benefit payments and/or ANPL estimated between 250% and 350% of revenues.	After applying a pension investment loss stress test with common probability and a revenue decline equal to a state's greatest decline since 2000, assets of state's largest pension system estimated to cover less than 5 years of benefit payments and/or ANPL estimated to exceed 350% of revenues.

Exhibit 5

Connecticut, New Jersey and Illinois face the highest risk from pension asset losses combined with a revenue decline

Estimated ANPL as % of revenues vs. cash flow stress of largest pension system following an investment market downturn



2018 own-source revenues used for most states. 2017 own-source revenues used for several states without fiscal 2018 comprehensive annual financial reports available. Illinois' revenue reflects our estimate for 2018, which incorporates an estimated impact from a state income tax hike.
Source: Moody's Investors Service

Investment losses would add leverage and force contribution increases to improve pension system cash flow

State pension risks are generally higher today than before the Great Recession. While the scale of volatile pension assets relative to state revenues is similar, the scale of unfunded liabilities is currently greater because losses from the last recession have not yet been amortized. Rising benefit outflows are also making pension systems more reliant on investment returns to build assets. Due to the concentration of most public pension assets in equities and other volatile investments, a recession that includes a significant market dislocation would increase states' unfunded liabilities and weaken the cash flow of their pension systems. A severely weakened pension fund--as measured by assets to benefit payments--would likely require a state to quickly raise contributions in order to prevent accelerated erosion of assets.

» Connecticut, Illinois and New Jersey are the three most susceptible states to our stress test. We estimate that Illinois' ANPL would exceed 600% of revenues and Connecticut's would be roughly 400% following a 2-standard deviation investment loss and concurrent revenue decline.

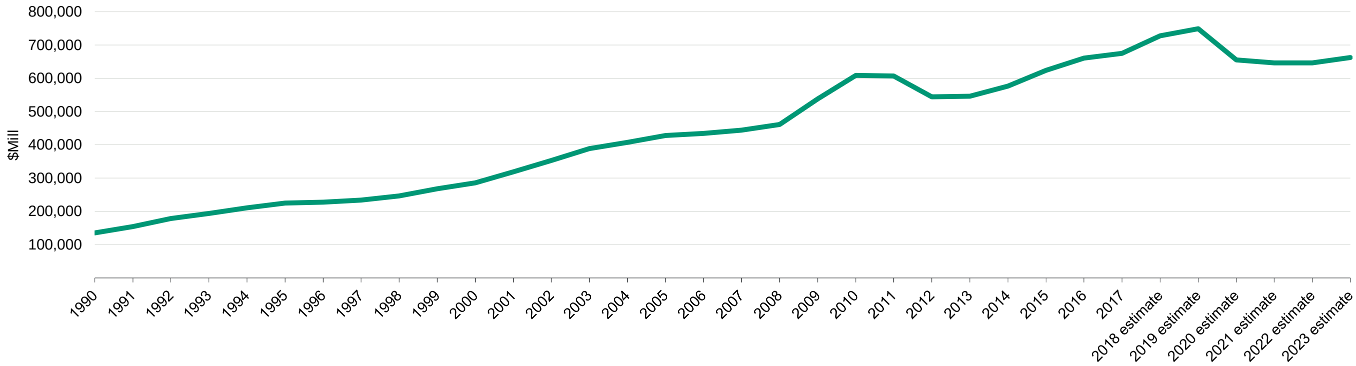
» New Jersey's ANPL relative to revenues would be lower than Illinois and Connecticut's in our stress scenario, but the cash flow position of its pension funds would be weaker. We estimate that New Jersey's Teachers' Pension and Annuity Fund would have assets amounting to roughly four years of benefit payments if it suffered steep investment losses, meaning the state would likely have to ramp up contributions above its current schedule to avoid significant asset depletion risk.

Federal aid might not be as generous as during the last recession

Exhibit 6

Federal funding to states was increased in the last recession

Total federal outlays for grants to state and local governments



Source: US Census Bureau

Wide federal budget deficits and a rising debt burden have reduced the fiscal space of the United States (Aaa stable) compared with its position before the most recent recession. The federal government therefore might not be in a position to help states in the next recession as it has in the past.

» In 2008-2009, the federal government responded to the financial crisis with a fiscal stimulus package designed to support the economy as well as state and local governments. One study showed that without the stimulus, the recession would have been more than three times deeper and lasted twice as long.

» One way the federal government helped state governments was by increasing the Medicaid matching rate (FMAP). Through this increase, the federal government allocated approximately $87 billion to the states between October 2008 and December 2010.

» Federal outlays to state and local governments increased again in 2017-2018 with healthcare reform and Medicaid expansion, which has been largely funded by the federal government.

» In previous downturns, fiscal expansion at the federal level has offset the shortfall in state revenues, thereby mitigating the procyclical impact of balanced budget rules at the state level. The economy will enter the next recession with less fiscal space than before the financial crisis. Thus the next time the economy experiences a large negative shock that pushes it into a recession, concerns around the level of federal deficits and debt, in addition to a polarized political environment, may hinder adequate counter cyclical fiscal response at the federal level. In the absence of strong federal fiscal support, states, most of which are subject to balanced budget rules, could amplify the shock to the real economy through expenditure cuts.

Assessing recession preparedness

Exhibit 7

Revenue volatility	Greatest 1 year operating revenue decline (2000-2018)		Stronger	Moderate	Weaker
			> -6.0%	-6.0% to -16.0%	< -16.0%
		25%	1	2	3
Coverage by reserves	Reserves available to cover a recession-scenario revenue gap (estimated by applying above decline percentage to FY 2020 revenues)		Stronger	Moderate	Weaker
			> 1.0x	0.5 to 1.0x	< 0.5x
		25%	1	2	3
Financial flexibility			Yes	No	
	Executive authority to cut expenses		0	1	
	Lack of super-majority for tax increases		0	1	
	Structural balance score of Aaa or Aa		0	1	
	Fixed costs percentage (debt service + pension treadwater + OPEB / own-source revenue) less than 50 state median (2017)		0	1	
	Medicaid spending (state share Medicaid spending / own-source revenue) less than 50 state median (2017)		0	1	
			Stronger	Moderate	Weaker
	Sum of financial flexibility scores		0	1,2,3,4	5
		30%	1	2	3
Pension risk	Combined susceptibility to balance sheet and cash flow tests		Stronger	Moderate	Weaker
		20%	1	2	3
			Stronger	Moderate	Weaker
	Range of potential scores		Top 30%	Middle 40%	Bottom 30%
	Recession preparedness total score		< 1.6	1.6 to 2.4	> 2.4

Source: Moody's Investors Service

The weaker states will face challenges in a recession

The two states assessed as weaker in recession preparedness are Illinois and New Jersey. They both have low levels of reserves relative to the potential revenue decline in our recession scenario. In addition, they both show weakness in their pension risk scores (see appendix).

What does this mean for their credit strength in the next recession?

» Depending on the depth and severity of the recession, as well as the type of recession and the sectors primarily hit, these states will see different impacts but are likely to face more difficult challenges than other states that we assess as moderate or stronger in preparedness.

» Given that states are highly rated (all investment grade) - in part because of the tools available to them to adjust spending and revenue - we would not expect significant credit deterioration in a recession, although these credits could weaken more or faster than most states.

» New Jersey has recently added to its reserves as the state works to improve its fiscal preparedness, while Illinois is developing a strategy to improve its pension funding and structural budget balance.

Appendix

State	Revenue volatility score (25%)	Coverage by reserves score (25%)	Flexibility combined score (30%)	Pension risk score (20%)	Recession preparedness
Alabama	Moderate	Moderate	Stronger	Stronger	**Stronger**
Alaska	Weaker	Stronger	Moderate	Moderate	**Moderate**
Arizona	Weaker	Moderate	Moderate	Stronger	**Moderate**
Arkansas	Stronger	Stronger	Moderate	Stronger	**Stronger**
California	Weaker	Moderate	Moderate	Stronger	**Moderate**
Colorado	Moderate	Moderate	Moderate	Moderate	**Moderate**
Connecticut	Moderate	Stronger	Moderate	Weaker	**Moderate**
Delaware	Moderate	Stronger	Moderate	Stronger	**Stronger**
Florida	Moderate	Stronger	Moderate	Stronger	**Stronger**
Georgia	Moderate	Stronger	Moderate	Moderate	**Moderate**
Hawaii	Moderate	Stronger	Moderate	Stronger	**Stronger**
Idaho	Moderate	Moderate	Moderate	Stronger	**Moderate**
Illinois	Moderate	Weaker	Moderate	Weaker	**Weaker**
Indiana	Moderate	Moderate	Moderate	Moderate	**Moderate**
Iowa	Moderate	Moderate	Stronger	Stronger	**Stronger**
Kansas	Moderate	Moderate	Moderate	Stronger	**Moderate**
Kentucky	Stronger	Weaker	Moderate	Moderate	**Moderate**
Louisiana	Moderate	Weaker	Moderate	Moderate	**Moderate**
Maine	Moderate	Moderate	Moderate	Stronger	**Moderate**
Maryland	Moderate	Stronger	Moderate	Moderate	**Moderate**
Massachusetts	Moderate	Moderate	Moderate	Moderate	**Moderate**
Michigan	Moderate	Moderate	Moderate	Stronger	**Moderate**
Minnesota	Moderate	Stronger	Moderate	Stronger	**Stronger**
Mississippi	Stronger	Stronger	Moderate	Stronger	**Stronger**
Missouri	Moderate	Stronger	Moderate	Moderate	**Moderate**
Montana	Moderate	Stronger	Stronger	Moderate	**Stronger**
Nebraska	Stronger	Stronger	Moderate	Stronger	**Stronger**
Nevada	Moderate	Moderate	Moderate	Stronger	**Moderate**
New Hampshire	Stronger	Moderate	Moderate	Stronger	**Stronger**
New Jersey	Moderate	Weaker	Moderate	Weaker	**Weaker**
New Mexico	Weaker	Stronger	Moderate	Stronger	**Moderate**
New York	Moderate	Weaker	Moderate	Stronger	**Moderate**
North Carolina	Moderate	Weaker	Stronger	Stronger	**Moderate**
North Dakota	Weaker	Stronger	Stronger	Stronger	**Stronger**
Ohio	Moderate	Stronger	Moderate	Stronger	**Stronger**
Oklahoma	Moderate	Weaker	Moderate	Stronger	**Moderate**
Oregon	Weaker	Moderate	Stronger	Stronger	**Moderate**
Pennsylvania	Moderate	Weaker	Moderate	Moderate	**Moderate**
Rhode Island	Moderate	Weaker	Moderate	Moderate	**Moderate**
South Carolina	Weaker	Stronger	Moderate	Moderate	**Moderate**
South Dakota	Moderate	Stronger	Moderate	Stronger	**Stronger**
Tennessee	Moderate	Stronger	Moderate	Stronger	**Stronger**
Texas	Moderate	Stronger	Moderate	Stronger	**Stronger**
Utah	Moderate	Moderate	Stronger	Stronger	**Stronger**
Vermont	Stronger	Stronger	Moderate	Stronger	**Stronger**
Virginia	Stronger	Stronger	Moderate	Stronger	**Stronger**
Washington	Stronger	Stronger	Moderate	Stronger	**Stronger**
West Virginia	Stronger	Stronger	Moderate	Stronger	**Stronger**
Wisconsin	Stronger	Stronger	Moderate	Stronger	**Stronger**
Wyoming	Weaker	Stronger	Moderate	Stronger	**Moderate**

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Reliance on top earners exposes states and downstream entities to revenue volatility, 20 March 2019

2019 outlook for US states remains stable with growing revenue and adequate reserves, 6 December 2018

Endnotes

1 The revenue declines of Alaska and Wyoming were not included in average and standard deviation calculations as they were significant outliers in the data.

2 To arrive at the two-standard deviation rate of loss for each pension system, we use our 2019 "risk-return map," which estimates an expected standard deviation of returns for a given target rate of return. Higher target returns correspond to higher standard deviations, and vice-versa.

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